

KOOTENAI RIVER WHITE STURGEON STUDY AND AQUACULTURE

8806400

SHORT DESCRIPTION:

Design, construct, and operate a sturgeon hatchery on the Kootenai Reservation, Idaho. Produce 4-8 families of white sturgeon progeny per year for preservation stocking using breeding protocol outlined by Dr. Harold Kincaid. Look at alternative uses for the hatchery all year round. Monitor and evaluate natural spawning of white sturgeon in response to Libby Dam discharge.

SPONSOR/CONTRACTOR: KTOI

Kootenai Tribe of Idaho
Sue Ireland, Fisheries Biologist/Administrator
Bonners Ferry, ID 83805
208/267-3620

SUB-CONTRACTORS:

Idaho Department of Fish and Game

GOALS

GENERAL:

Supports a healthy Columbia basin, Maintains biological diversity, Maintains genetic integrity, Increases run sizes or populations, Adaptive management (research or M&E)

RESIDENT FISH:

Production

NPPC PROGRAM MEASURE:

10.8B.14

RELATION TO MEASURE:

This project has been operating and maintaining a white sturgeon hatchery on the Kootenai Reservation in Idaho. The white sturgeon conservation aquaculture program has been identified as a Priority 1 action for implementation by the USFWS to prevent extinction of the Kootenai River white sturgeon.

BIOLOGICAL OPINION ID:

USFWS BO Incidental Take

TARGET STOCK

Kokanee

White sturgeon

LIFE STAGE

N/A

N/A

MGMT CODE (see below)

W

(L)

BACKGROUND

Stream name:

Kootenai River

Subbasin:

Kootenai

Hydro project mitigated:

Libby Dam

HISTORY:

The project started in 1988 in response to the virtual absence of white sturgeon recruitment in the Kootenai River since 1974. Since then the Kootenai Tribe of Idaho began designing, building and operating an experimental aquaculture facility to address factors responsible for the lack of natural white sturgeon recruitment. This facility, an integral part of this project, has confirmed that gametes of male and female white sturgeon are viable, and that Kootenai River water quality is sufficient to rear young fish. Now the conservation aquaculture program has been identified by USFWS as a Priority 1 action to prevent extinction of the Kootenai River white sturgeon. With the exception of 1996, year classes of white sturgeon have been successfully produced in the Kootenai Hatchery every year that the facility was in operation. Additionally, the Tribe and IDFG have coordinated monitoring and evaluation of natural spawning of white sturgeon in response to experimental flow releases from Libby Dam.

BIOLOGICAL RESULTS ACHIEVED:

1989-1996: Construction of an Experimental Hatchery that has demonstrated eggs and sperm from Kootenai River white sturgeon are viable, can be raised to a size large enough to be PIT tagged and released into the river. Developed broodstock collection techniques and spawning methodologies for white sturgeon. Successfully produced offspring for the conservation aquaculture program every year the facility has been in operation, with the exception of 1996. Reared disease free rainbow trout in the hatchery. Tracked transmitted hatchery reared juvenile sturgeon in the Kootenai River. Tracked transmitted hatchery reared juvenile sturgeon in the Kootenai River. In coordination with IDFG and MDFWP monitored and evaluated sturgeon flow proposals 1993, 94, 95, and 96. Finished second year of water quality and sediment sampling in the Kootenai River. Completed kokanee spawning ground surveys in Kootenai River tributaries below Kootenai Falls (1993, 94, 95, and 96). Obtained Section 10 permit from the USFWS and participated in the development of the USFWS Kootenai River white sturgeon draft recovery plan.

PROJECT REPORTS AND PAPERS:

Monthly reports 1990-1996. Annual Reports FY 1990, 1991, 1992, 1993, 1994, and 1995. "Natural Spawning of White Sturgeon (*Acipenser transmontanus*) in the Kootenai River, Idaho, 1994." Preliminary Report of Research. KTOI, IDFG and MDFWP.

ADAPTIVE MANAGEMENT IMPLICATIONS:

This project will provide the necessary means to prevent extinction of the endangered Kootenai River white sturgeon population.

PURPOSE AND METHODS**SPECIFIC MEASUREABLE OBJECTIVES:**

1) Annual production of 4-8 families of white sturgeon progeny, produced in a manner to protect and potentially enhance the Kootenai River white sturgeon population's genetic diversity. 2) Determination of whether altered hydrographs and thermographs produced downstream from Libby Dam can result in natural life cycle completion for Kootenai River white sturgeon.

CRITICAL UNCERTAINTIES:

The Post-dam Kootenai River's ability to allow natural life cycle completion for white sturgeon.

BIOLOGICAL NEED:

The Kootenai River population has had failed recruitment for most of its 22 post-impoundment years. With the exception of the conservation breeding program proposed by the Kootenai Tribe of Idaho, all management and research activities on the Kootenai River have failed to result in the natural completion of the white sturgeon's life cycle, and reduction of the extinction threat. The Kootenai Hatchery is the only currently known means to protect the genetic diversity of this population and prevent extinction.

HYPOTHESIS TO BE TESTED:

The conservation aquaculture program and preservation stocking program will preserve the existing gene pool and begin to re-establish natural age structure of the population.

ALTERNATIVE APPROACHES:

N/A

JUSTIFICATION FOR PLANNING:

N/A

METHODS:

Kootenai Hatchery: 1) Conservation aquaculture will produce 4-8 families of Kootenai River white sturgeon in the Kootenai Hatchery following genetic preservation protocol outlined by Dr. Harold Kincaid. 2) Presently, statistical analyses are not used on the hatchery portion of this project. However, in the future statistics concerning genetic variation among individuals, and on the effects of releasing juveniles from the hatchery to the wild population will be performed. 3) Only adult white sturgeon from the Kootenai River will be used to produce progeny to maintain genetic variability and protect this population from extinction. Monitoring and Evaluation of natural spawning: 1) D-ring nets, artificial substrate mats, predator stomach analysis, and in-river

experiments with egg and larval survival will monitor success and failure of natural recruitment in order to determine appropriate recovery measures for endangered Kootenai River white sturgeon. Sampling protocol will be standardized to test for differences in reproductive success among years. 2) Statistical tests of natural recruitment will occur among years, testing results of different flow regimes and other experimental system changes on annual white sturgeon reproduction in the Kootenai River. 3) This work includes wild juvenile and adult white sturgeon in the Kootenai River. Also included is research on growth, survival, habitat use and diet selection/food availability using hatchery reared white sturgeon.

PLANNED ACTIVITIES

SCHEDULE:

<u>Planning Phase</u>	<u>Start</u> 1996	<u>End</u> unknown	<u>Subcontractor</u>
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Task (1) Participate in the recovery plan of the Kootenai River white sturgeon under the ESA. (2) Continue to monitor natural spawning and recruitment of white sturgeon relative to experimental discharge from Libby. (3) Perform field investigations to refine age distributions, age and growth characteristics and growth rates of sturgeon. (4) Monitor hatchery reared juvenile sturgeon released into the Kootenai River for habitat, growth and distribution information. (5) Acquire IFIM model to evaluate sturgeon data collected during experimental releases. (6) Determine senility rates of female sturgeon. (7) Collect and return broodstock unharmed to the river. Produce 4-8 families per year following genetic preservation protocol outlined by Dr. Harold Kincaid. Rear progeny in at least two separate locations, refine non-surgical egg collection techniques, develop cryopreservation techniques, refine and implement a genetically sound conservation program for white sturgeon at the existing hatchery. (8) Develop permanent t

<u>Implementation Phase</u>	<u>Start</u> 1996	<u>End</u> unknown	<u>Subcontractor</u>
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<u>O&M Phase</u>	<u>Start</u> 1996	<u>End</u> unknown	<u>Subcontractor</u>
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Task Operate Kootenai River white sturgeon hatchery to produce 4-8 families per year for preservation stocking until evidence is available to show that natural reproduction is yielding adequate recruits to sustain the genetic variability of the population.

CONSTRAINTS OR FACTORS THAT MAY CAUSE SCHEDULE OR BUDGET CHANGES:

The risk of extinction of the Kootenai River white sturgeon population is greater than risks of project implementation.

OUTCOMES, MONITORING AND EVALUATION

SUMMARY OF EXPECTED OUTCOMES

Expected performance of target population or quality change in land area affected:

Annual production of white sturgeon in the Kootenai Hatchery. Determination of post-dam Kootenai River's ability to allow natural life cycle completion of white sturgeon. Operate Libby Dam consistent with previous determinations.

Present utilization and conservation potential of target population or area:

The white sturgeon population in Kootenai River is listed as endangered and is not used for recreational, subsistence, or cultural purposes. Kootenai populations from the lower tributaries to the Kootenai River are considered "functionally extinct" and are no longer used for recreational, subsistence, or cultural purposes.

Assumed historic status of utilization and conservation potential:

Historically, both white sturgeon and kokanee provided recreational, subsistence, and cultural opportunities.

Long term expected utilization and conservation potential for target population or habitat:

Long term objectives are to provide suitable habitat conditions and restore an appropriate age-class structure and effective population size to ensure a self-sustaining Kootenai River population of white sturgeon. Long term objectives for kokanee are to restore the populations to historic levels to allow for sustainable harvest for recreational, subsistence, and cultural purposes.

Contribution toward long-term goal:

Kootenai River white sturgeon and kokanee

Indirect biological or environmental changes:

Actions taken to recover white sturgeon and kokanee could have positive effect on other native species such as burbot, westslope cutthroat, redband trout, and bull trout.

Physical products:

N/A

Environmental attributes affected by the project:

Water temperature, flow, floodplain

Measure of attribute changes:

N/A

Coordination outcomes:

1989-1996: Construction of an Experimental Hatchery that has demonstrated eggs and sperm from Kootenai River white sturgeon are viable, can be raised to a size large enough to be PIT tagged and released into the river. Developed broodstock collection techniques and spawning methodologies for white sturgeon. Produced progeny from 4 families to be used in the preservation stocking program. Reared disease free rainbow trout in the hatchery. Tracked transmitted hatchery reared juvenile sturgeon in the Kootenai River. In coordination with IDFG and MDFWP monitored and evaluated sturgeon flow proposals 1993, 94, 95, and 96. Finished second year of water quality and sediment sampling in the Kootenai River. Completed kokanee spawning ground surveys in Kootenai River tributaries below Kootenai Falls (1993, 94, 95, and 96). Obtained Section 10 permit from the USFWS and served on the Kootenai River Basin Steering Committee and USFWS Kootenai River white sturgeon Recovery Team.

FY 96: (1) Participate in the recovery plan of the Kootenai River white sturgeon under the ESA. (2) Continue to monitor natural spawning and recruitment of white sturgeon relative to experimental discharge from Libby. (3) Perform field investigations to refine age distributions, age and growth characteristics and growth rates of sturgeon. (4) Monitor hatchery reared juvenile sturgeon released into the Kootenai River for habitat, growth and distribution information. (5) Acquire IFIM model to evaluate sturgeon data collected during experimental releases. (6) Determine senility rates of female sturgeon. (7) Collect and return broodstock unharmed to the river. Rear progeny in at least two separate locations, refine non-surgical egg collection techniques, develop cryopreservation techniques, refine and implement a genetically sound conservation program for white sturgeon at the existing hatchery. (8) Develop permanent tagging and marking techniques for artificially propagated sturgeon. (9) Investigate kokanee fishery improvement opportunities by collecting baseline information in the lower tributaries and implement measures necessary to recover kokanee to sustainable harvestable levels. (10) Sub contract to qualified laboratory to analyze water and sediment samples from the Kootenai River. (11) Provide hatchery reared sturgeon to labs and universities for research projects. (12) Establish experimental broodstock with progeny from the Kootenai Sturgeon Hatchery.

1994-unknown: Reestablish white sturgeon year classes in the Kootenai River during this period either through natural production or from aquaculture practices. 1994-unknown: Determine the most effective adaptive river management operations to ensure repeatable natural spawning and recruitment of white sturgeon in the Kootenai River.

MONITORING APPROACH

(See Methods section)

Information feed back to management decisions:

Kootenai River white sturgeon recovery team will evaluate success of programs and determine delisting criteria.

Critical uncertainties affecting project's outcomes:

Effective monitoring and evaluation of outplanted hatchery produced white sturgeon will provide information about growth, survival, and habitat use. The goal of the breeding program is to produce 4-10 breeding adults from each family.

EVALUATION

Delisting of Kootenai River white sturgeon

Incorporating new information regarding uncertainties:

Adaptive management will be used in the recovery of the Kootenai River white sturgeon. As new information becomes available, program objectives will be adjusted through the coordinating efforts of the Kootenai River Basin Steering Committee and the Kootenai River White Sturgeon Recovery Team.

Increasing public awareness of F&W activities:

The conservation aquaculture program at the Kootenai Tribal Hatchery has been an excellent opportunity to educate the public about the recovery of endangered species. Many groups visit the facility every year and the media frequently contacts the Kootenai Tribal fisheries department with questions about various aspects of the program.

RELATIONSHIPS**RELATED BPA PROJECT****RELATIONSHIP**

9404900 All work is performed in the Kootenai River system and is coordinated through the Kootenai River Basin Steering Committee.

9401200 All work is performed in the Kootenai River system and is coordinated through the Kootenai River Basin Steering Committee.

8806500 All work is performed in the Kootenai River system and is coordinated through the Kootenai River Basin Steering Committee.

8346700 All work is performed in the Kootenai River system and is coordinated through the Kootenai River Basin Steering Committee.

OPPORTUNITIES FOR COOPERATION:

Participation in Kootenai River Basin Steering Committee and the federal Kootenai River White Sturgeon Recovery Team will expedite hatchery production and simultaneous ecosystem restoration. Research will guide restorative measures.

COSTS AND FTE

1997 Planned: \$620,000

FUTURE FUNDING NEEDS:**PAST OBLIGATIONS (incl. 1997 if done):**

<u>FY</u>	<u>\$ NEED</u>	<u>% PLAN</u>	<u>% IMPLEMENT</u>	<u>% O AND M</u>	<u>FY</u>	<u>OBLIGATED</u>
1998	\$620,000	10%	50%	40%	1988	\$117,653
1999	\$680,000	10%	50%	40%	1989	\$156,104
2000	\$720,000	10%	50%	40%	1990	\$236,430

2001	\$800,000	10%	50%	40%	1991	\$150,000
2002	\$840,000	10%	50%	40%	1992	\$179,723
					1993	\$649,573
					1994	\$378,553
					1995	\$952,387
					1996	\$67,356
					1997	\$726,650

TOTAL: \$3,614,429

Note: Data are past obligations, or amounts committed by year, not amounts billed. Does not include data for related projects.

OTHER NON-FINANCIAL SUPPORTERS:

USFWS, MDFWP, IDFG, BC MELP, U of I, UCUT

LONGER TERM COSTS: \$840,000

Implementation and O&M

1997 OVERHEAD PERCENT: 59.5%

HOW DOES PERCENTAGE APPLY TO DIRECT COSTS:

Applies only to personnel costs

CONTRACTOR FTE: 6

SUBCONTRACTOR FTE: 1